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THE ASCENT OF MOUNT HALCON, MINDORO

By E. D. MERRILL
(From the Botanical Division, Bureau of Science)

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(Concluded on third page of cover.)

THE ASCENT OF MOUNT HALCON, MINDORO.[1]

By **Elmer D. Merrill.**

(From the botanical section of the Biological Laboratory, Bureau of Science.)

The Philippine Archipelago is essentially mountainous. Many of the high peaks have been ascended by white men, although accurate accounts as to when, by whom and under what circumstances the explorations were made are to be found in but few instances. On making local inquiries in regard to the ascent of mountains one usually hears vague rumors of previous attempts to climb them, entailing great difficulties, privations and not infrequently loss of life. Usually, however, it is quite impossible to verify many of these rumors for, as a rule, natives living in the vicinity of the mountains have very little information regarding them, and because of prevailing superstitions it frequently is difficult to induce them to accompany a party when the known object of the expedition is to ascend a high mountain.

Mountain climbing in the Tropics, especially in such tropical countries as the Philippines, can scarcely be classed as a sport, and here as in other parts of Malaya, the higher mountains have usually not been ascended by persons for the pure love of mountain climbing, but by those who have had some special object in view, such as the study of the fauna, flora or geology of the region. In other words, the high peaks of the Philippines, as in the Malayan region generally, have been ascended mostly for what was to be secured on them.

Mount Apo in southeastern Mindanao is the highest in the Philippines, yet the first recorded ascent which I have been able to find is that of *J. Montano,* a Frenchman, who reached the summit in October, 1880.[2] Montano, however, states that an attempt was made by the Spaniards in 1852 under the direction of *Oyanguren,* which failed after the loss of twenty men, and that in 1870, *Real,* then the governor of Davao, made another, but unsuccessful endeavor, to reach the summit. Dr. *A. Schadenberg* ascended Apo in February, 1882, and *Otto Koch* must have made the ascent at about the same time for Vidal[3] figures some species of plants from the summit of Apo which were collected by the latter. Since 1880 Mount Apo has been climbed many times by various persons, to my knowledge by at least ten Americans within the past five years, and I am informed by those who have made the ascent that there are comparatively few difficulties to be encountered, either in the approach to the mountain or in its ascent. Nevertheless, as late as 1905 I have seen accounts in Manila newspapers "of the first ascent of Mount Apo."

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[1] This is the first of a series of articles on geographical subjects which it is proposed to publish.—P. C. F.

[2] Voyage aux Philippines et en Malasie (1886), 245–264.

[3] Sinopsis, Atlas (1883).

We have no records that Mount Malindang, the second highest mountain in the Philippines, had been ascended previous to 1906, when in May of that year Maj. *E. A. Mearns* and *W. I. Hutchinson* and their party reached the summit. Mounts Banajao, Pinatubo, Tonglon, Datá, Solis, and Mayón, all in Luzon, Canlaon in Negros, Madiaas in Panay, all 7,000 feet in altitude or higher, have been ascended one or many times each, by various persons, and secondary mountains such as Mariveles, Arayat, Maquiling, Isarog and Iriga in Luzon, Silay in Negros, Pulgar and Victoria in Palawan, and many others, are more or less known.

Halcon the third highest peak in the Philippines, is situated in the north-central part of Mindoro. With no known trails leading to it, surrounded by dense forests, cut off from the coast by difficult ridges and large rivers subject to enormous and appalling floods, it stood seemingly inaccessible. Its location is perhaps in the most humid part of the Philippines, where the rains continue for nine months in the year, in a region geographically quite unknown and inhabited by a sparse population of entirely wild and very timid people, and on an island regarding which there is a widespread and generally accepted belief as to its unhealthfulness. Although within 100 miles of Manila and not more than 15 from Calapan, the capital of Mindoro, so far as I have been able to determine it remained unconquered up to the year 1906.

MINDORO.

Mindoro ranks as seventh in size among the islands of the Philippine Archipelago, being located a little north of the center of the entire group and having an area of approximately 3,851 square miles. In general outline it is roughly triangular, its greatest length being from northwest to southeast, 110 miles, its greatest breadth from northeast to southwest, 56 miles. Geographically, it is in closer proximity to Luzon than to any other large island of the group.

Verde Island passage, separating Mindoro from the south coast of Batangas Province, Luzon, is but 7½ miles in width in its narrowest part between Escarceo Point, Mindoro, and Malocot Point, Luzon. The small island of Lubang lies 15 miles north of the northwest point, while the larger island of Marinduque is 23 miles east of the central part of Mindoro. Tablas is situated 31 miles east of southern Mindoro, and Panay 36½ miles east of south. Busuanga, the beginning of the Palawan chain, is 33 miles southwest.

The name Mindoro is of Spanish origin, taken from *Mina de oro*, meaning mine of gold, applied by the earlier Spanish explorers. It came no doubt from tales imparted to them by the natives of the fabulous mineral wealth of the island, yet for over three and three-quarters centuries this reputed golden treasure has remained undiscovered. The ancient native name of the island was Mait.

Topographically, Mindoro is exceedingly rough and the interior is very imperfectly understood; it is known locally as "the Africa of the Philippines." The mountains in the north culminate in the Halcon Range, the highest peak being exceeded among Philippine mountains only by Apo and Malindang, both in Mindanao.

The census of the Philippine Islands taken in 1903 gives the total population of Mindoro as 28,361, of which 21,097 are classified as civilized and 7,264 as wild. As comparatively little is known regarding the Mangyans, the aborigines inhabiting the interior, the latter figure must be considered as approximate rather than exact. The civilized inhabitants are confined entirely to the coast region, the Tagalogs predominating in the north, the Visayans in the south.

Undoubtedly the Negritos are the aboriginal inhabitants of the island and the Mangyans are the descendents of Negrito and Malayan stock. They are confined entirely to the interior of Mindoro, except in the southern part, where one or two towns of semicivilized Mangyans are located on the coast. Capt. R. G. Offley,[4] United States Army, Governor of Mindoro, states that they are non-Christian but not savages by nature or habit, that they will run at sight of a stranger if his coming and intentions have not previously been announced. They are divided into several groups, the chief among which are the Buquit, Bañgon and Batanganes; these roam in bunches or by families, the oldest acting as chief; they are willing workers, but they have no knowledge whatever of agriculture, and the Christian Filipino avails himself of the fact that they do not know the value of money by giving a handful of salt for a banca, while the price of a small working bolo to a Mangyan has been known to be ten years of servitude. The best description of these people which I have seen is that given by Dean C. Worcester,[5] to whose book the reader is referred. In regard to the Mangyans as a whole, Captain Offley's statement is inaccurate in some respects, for the ones we encountered on the north slopes of Halcon have fairly permanent habitations and also possess a decided knowledge of agriculture, although it is of a very primitive kind. We saw but three representatives of these people on the entire trip, an old man, a boy and a girl, but we passed through numerous clearings, some of them several hundreds of acres in extent where there were houses; however, the inhabitants fled at our approach. In one clearing, at an altitude of about 3,000 feet, we found in cultivation: rice, corn, sugar-cane, bananas, yams, sweet potatoes, tomatoes, beans, squashes and taro, while domestic pigs and chickens were in evidence. Most of the dwellings were very small and primitive, consisting of a platform raised two or three feet above the ground, with a thin palm-leaf roof and usually without walls, but in the clearing mentioned above we found an unusually large and well-constructed house about 20 feet long, 15 feet wide and 12 feet from the floor to the apex of the roof. It was firmly constructed, elevated on posts about 6 feet above the ground, with a pole floor and grass-thatched roof and walls and was evidently the abode of a person of prominence in a local tribe. Such a pretentious house certainly is unusual among the Mangyans.

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[4] Census of the Philippine Islands (1903), 2: 547.

[5] The Philippine Islands and their People (1901), 375–377; 406–418.

Mindoro has attained and still retains a widespread but apparently not entirely deserved reputation for unhealthfulness, frequently being spoken of as "the white man's grave." In spite of adverse reports as to the unwholesomeness of Mindoro and the prevalence of fevers and various tropical diseases in the island, on our trip, which extended over forty days in the height of the rainy season when on nearly every day all members of the party were wet at least once and sometimes all day and for many days in succession, working our way slowly through drenched forests, fording streams and much of the time on short rations, none of the Americans in the party were sick and among the twenty-five natives employed, only three contracted fever and then in a very mild form. In common with previous explorers in Mindoro, we found the leeches very abundant and exceedingly troublesome at the lower altitudes but we became entirely free of them after reaching the height of about 5,000 feet. Ordinary brown soap was found to be an excellent leech repellant and this was given each day to our native carriers who smeared it on their naked legs. Previous experience had taught us that canvas or leather leggings are entirely unsatisfactory as a protection against leeches, and all the Americans in the party were equipped with woolen "puttees." These proved to be more satisfactory and gave absolute protection against the attacks of leeches. Quinine was issued regularly to all members of the party.

MOUNT HALCON.

The name Halcon is of Spanish origin signifying falcon, but the application of this name to the mountain is not clear. As usual, the native names vary. According to Lieut. Fitzhugh Lee's report of his trip made across Mindoro in 1904, the natives living at the mouth of the Baco River knew it as the Alag Mountain. We found those living at Subaan, only 7 miles from Baco, speaking of it as the Baco.

The altitude of the highest peak is given on Spanish charts as 3,865 meters, while our uncorrected aneroid readings determine an altitude of 9,000 feet, both of these records apparently, being too high. In April, 1906, a triangulation party of the Coast and Geodetic Survey, under the direction of Mr. O. W. Ferguson, estimated the height of the mountain as 8,504 feet, the mean of three determinations from as many different stations. The same party ascertained the geographical coördinates of the highest peak to be latitude N. 13° 15′ 46″, longitude E. 120° 59′ 29″.

Viewed from the coast, Halcon appears to present no particular difficulties so far as the ascent is concerned. It is a long, more or less broken ridge running from east to west, presenting steep slopes, especially on the north, but with three pronounced spurs with more gradual slopes leading from it, one to the east, one to the south and one to the west. The crest line of these spurs present rather gradual slopes, although they are steep in places. Several subsidiary spurs lead off from the main range in various directions, notably to the north. Difficulties encountered in making the ascent of Halcon, as is the case with most Philippine mountains, were found to be not so much in the actual climbing as in the approach to the mountain, the fording of streams, the crossing of ridges, the cutting of trails through the dense vegetation and in the transportation of necessary supplies and equipment.

The highest peak of Halcon shows no signs whatever of ever having been visited by human beings, and as it would be a physical impossibility for any person to reach the summit without extensive trail cutting, it seems evident that in recent years at least, it has never been visited by man. Several attempts to reach the top of the mountain have been made and in the past three centuries it is possible, but not probable, that some of the early Spanish explorers in their search for the fabulous mineral wealth of Mindoro, might have made the ascent. I have been able to find no account whatever of attempts made by the Spaniards, and the utter inaccuracy of Spanish maps as to the location of Halcon Peak and the course of the Alag and Baco rivers would indicate that they had no positive knowledge whatever of this part of Mindoro. In fact, on many maps such a large river as the Alag is not indicated at all, although it joins the Baco at tide water and at less than 3 miles from the coast.

PREVIOUS ASCENTS OF THE MOUNTAIN.

In April, 1891, *Dean C. Worcester* visited some Mangyan clearings on the slopes of Mount Halcon, probably ascending to about 2,500 or 3,000 feet. However, so far as I can learn he made no attempt to reach the summit, but his trip in this vicinity is the first one of which I have any knowledge. The reader is referred to his own account of his Mindoro experiences.[6]

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[6] *Loc. cit.*

In October, 1895, *John Whitehead,* an English naturalist tried to reach the summit, but although he did not succeed in attaining the highest peak he was undoubtedly the first person to reach an altitude of 6,000 feet. As Whitehead's primary object was to collect objects of natural history and especially birds, he apparently made no serious attempt to reach the highest point on the mountain. I can do no better here than to quote from W. R. Ogilvie-Grant's[7] account of Whitehead's experience on Mount Halcon.

> On the 19th of Octber, 1895, he (Whitehead) left Manila with a staff of seven collectors for the Island of Mindoro, with the object of exploring the well-wooded highlands of this comparatively little known island, and returned to Manila on the 16th of February, 1896, after four months' absence. The results of this expedition are, Mr. Whitehead considers, by no means satisfactory, for at the time of his visit the wet season was at its height and, owing to the almost continuous rains, collecting could be carried on only under the greatest difficulties. He tells us that during his stay on Mindoro seventy days out of a hundred were very wet, twenty dull and drizzling, while but ten were comparatively bright and fine; so it can be understood easily that he was unable to do as much as he had hoped.
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> Unfortunately, he experienced great trouble with his collectors, all of whom suffered at one time or another from fever, and took every opportunity of misbehaving. One man robbed him of his money, while others, left at the foot of the mountain to make a lowland collection, did practically nothing during many weeks, and sold both gun-caps and powder to the natives. He characterizes his Mindoro collection as representing "four months' very hard work and slow starvation"
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> On landing in Mindoro a guide was engaged as pilot to the high ground, but this worthy led the expedition by a wrong path, and after a long day's march in the usual deluge of rain, Mr. Whitehead found himself on the bank of a fine river surrounded by the most dense and magnificent forest, where he was forced to remain for ten days waiting for porters. It was here that the expedition was nearly wrecked, the river coming down in a tremendous flood with very little warning. The camp had been pitched about 20 feet above the river, which at this part was about 200 yards wide, but in less than twelve hours, fortunately in daylight, the water was running from 2 to 3 feet deep like a mill race through Mr. Whitehead's tent, while his men had to escape in canoes from another house lower down the river, where most of the less portable boxes had been left.
>
> By great exertions all the baggage was saved. "I have," writes Mr. Whitehead, "seen a good deal of Tropics, but I never encountered such deluges, such incessant rains, or such thousands of leeches. The leeches quite crippled two of my men, and one of the two caught 'beriberi' so I sent him back to Manila. All the others had fever, but I got off with two mild attacks of dysentery. I was so reduced, from having nothing to eat but tinned foods and rice, that I became quite weak, losing most of my energy at times. In four months I had eaten only five pigeons, two parrots, and some few thrushes, and, with the exception of eggs, there was no other fresh food to be had." Such is life in the highlands of the Philippines.
>
> By making friends with the true aborigines of Mindoro (the Mangyans) the twenty-five porters required to carry the baggage to the mountains were at last

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[7] Grant, W. R. Ogilvie: On the Birds of the Philippine Islands, Part 7. The Highlands of Mindoro. With field notes by John Whitehead. *Ibis:* (1906) VIII, 6, 457.

obtained, and, after two days' march under continuous heavy rain, Mr. Whitehead and his men camped at an altitude of 4,500 feet on Mount Dulangan, in the main range of Mindoro. This range of mountains is somewhat horseshoe shaped. Mr. Whitehead continuous: "To cut a long story short, it rained all November, all December and all January; one deluge began on the 11th of December, and was perhaps second only to that which floated Noah and his great zoölogical collection, for it continued until the 6th of January, 1896. But for all this I was in good health the climate being cool, seldom over 60° F., and some nights only 52° F.; the mountain of the east side is perhaps over 8,000 feet, but the ranges are mostly from 5,000 to 6,000 feet. I was guided by the natives to a part that attained nearly 6,000 feet, but we could not reach the crest of the mountain from this position. The undergrowth is very dense and, without cutting paths, impossible to get through."

In April, 1904, Lieutenant *Fitzhugh Lee, Jr.,* Twelfth United States Cavalry, accompanied by three other officers, Mr. *H. D. McCaskey,* Chief of the Philippine Mining Bureau, ten Americans soldiers and thirty native carriers, left Camp McGrath, Batangas, Luzon, with the object of crossing northern Mindoro and if possible, of making the ascent of Halcon. They landed at the mouth of the Baco River and on April 3 proceeded up that river to the junction of the Alag, following that stream in boats to the head of navigation, an estimated distance of 5½ miles. The Alag was chosen as the most feasible route because its direction is more westerly and because the natives insisted that its source was somewhere in the vicinity of Alag, the local name of Mount Halcon. On April 4 the boats were abandoned, the river having become very shallow and swift. The expedition then followed a narrow trail along the bank, the carriers being assigned about 80 pounds each. The stream was very tortuous, averaging from 50 to 60 yards in width and the party was compelled to ford five or six times during the morning's march. On April 5 the advance was continued up the bed of the river but the loads for the carriers had to be reduced in weight, progress being exceedingly slow and hard, as the rocks in the river bed bruised the carriers' feet. On this day the distance covered was but 3 miles and on the day following but 3½ miles. On the 7th of April progress was reported to be very difficult and dangerous because of the large bowlders in the stream bed, the swift current and the steep cliffs on both sides, and on this day they went but 2½ miles. Lieutenant Lee continues:

> "It seems to be more difficult than we had anticipated to locate Mount Halcon. Our field of vision is very limited, confined as we are in the bottom of a deep cañon with lofty perpendicular walls and a wilderness of vegetation growing out from either side overhead. Just at this time we are particularly anxious to get a bearing on the mountain that we may locate the easiest course for an ascent."

On this days' march several of the party came in contact with some poisonous plant, spoken of a species of "poison ivy,"[8] which on the following days caused them much suffering and inconvenience, eruptions breaking out all over their bodies, and the faces of some individuals swelling so that they could see only with difficulty. On April 8 they succeeded only in covering 2½ miles but they were fortunate in securing the services of a Mangyan as a guide. On the following day, finding further progress up the Alag impossible, they retraced their steps a short distance, leaving the cañon of the Alag and following the bed of a small river flowing from the west,[9] making camp in the bed of this stream at an altitude of 1,500 feet. It rained at intervals during the day and all the night and the party gave up hope of ascending Halcon. On April 10 and 11 they crossed the divide at an altitude of 3,230 feet, striking the headwaters of the Bagbaujan River flowing westward, in these two days suffering much from the attacks of leeches and from the constant rain. On the night of April 12 a camp was made in the narrow cañon of the Bagbaujan but, at 8 p. m., because of the heavy rain and the sudden rise in the river, the water coming up about 5 feet in one-half hour, the party were obliged to desert their tents in the darkness and take shelter on a ledge above. The rain continued until 10 p. m. when the river subsided as fast as it had risen. On the following day they went down the river for a distance of 1¾ miles, being obliged to make use of ropes for scaling the cliffs. This method of procedure continued on the morning of the 14th, but later in the day they came out into a more open country and left the river bed. As much of their food had become wet owing to the prolonged rains, the question of rations became a very serious one and caused the members of the party considerable anxiety. However, after the 14th, no grave difficulties were encountered, the party continued on down the Bagbaujan and reached the mouth of the river on April 19, having been seventeen days in crossing Mindoro.

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[8] Probably *Semecarpus perrottetii* March (*Anacardiaceae*).—E. D. M.

In June, 1906, Lieut. *T. H. Jennings,* Seventh United States Cavalry, accompanied by Mr. *M. L. Merritt* of the Philippine Forestry Bureau, made an attempt to ascend Halcon, but little information regarding their trip and experiences is available other than Mr. Merritt's report, who being ordered to reach Manila on the last of June was obliged to return to Calapan before the highest part of the mountain was reached. The party left Calapan on the morning of June 13, going overland by a trail leading inland, reached the Catuyran River, the south fork of the Baco, on the morning of the succeeding day and proceeded up this for some distance, and then followed a stream known as the Dulangan River which flows from the Halcon Range. Here most of their carriers deserted them, and they were delayed in securing more. Continuing up the Dulangan River on the 16th, they left the bed of the stream on the following day and took one of the ridges, which was followed on the 18th and 19th until they arrived at the place where Whitehead had established his camp in 1895. Up to this point the trail was fair. On June

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[9] Apparently the Bolton River. (See map.)

21, believing that they were on a ridge leading directly up the mountain, they continued up to an altitude of 5,250 feet, the side slopes of the ridge which they were on being described as very steep and extending for 2,000 feet below. Continuing along the ridge for the succeeding days, on June 26 they reached a peak having an altitude of 7,250 feet, but, on the following day in going along the ridge towards the main range, they came to an impassable cañon separating the spur on which they were from the main range, and accordingly plans were made to descend into the deep valley to the west and to follow the ridge beyond. However, Mr. Merritt who was obliged to return to the coast, left the party on the 28th of June and returned to Calapan. Regarding Lieutenant Jennings' experiences after this date we have no information except that he reached Calapan on the 7th of July, having attained the main ridge on Halcon but not the highest peak. Mr. Merritt's report shows that from June 14 to June 27, rainy weather prevailed most of the time.

Previously Lieutenant *Jennings* had made a trip into the interior of Mindoro north of Halcon, following Lieutenant Lee's course up the Baco and Alag Rivers for an estimated distance of 10 miles, where he left the Alag and ascended the ridge to the north, reaching the Binabay River. Mounting the ridge to the north of the Binabay, he followed it for three days, mostly in a westerly direction, finally he recrossed the Binabay River and taking the ridge between it and the Alag River, he continued for five days, going west and somewhat north of west, reaching an altitude of 6,000 feet on a ridge some distance north of Mount Halcon. He reported from his experience on this trip that he did not consider the route from the north a feasible one for the ascent of Halcon, recommending that whoever should make the attempt to climb the mountain, should try a route from the vicinity of Lake Naujan or from the west coast of Mindoro.

OUR OWN ASCENT OF HALCON.

A geographical and biological expedition to Mount Halcon was planned in October, 1906, under the direction and with the support of Maj. Gen. Leonard Wood, its object being to determine some feasible route to the mountain, to ascend the highest peak, to secure as much data as possible and to collect objects of natural history. The party was under the immediate direction of Dr. *E. A. Mearns,* major and surgeon, United States Army, accompanied by Mr. *W. I. Hutchinson,* of the Philippine Forestry Bureau, and myself, with one topographer, one hospital corps man, a sergeant and five privates of the Twenty-fifth Company of Philippine Scouts, two natives assistants for Dr. Mearns, and five native carriers from Antipolo, Luzon. Fifteen additional native carriers were secured at Subaan, Mindoro.

We spent the day after our arrival on the morning of October 31 at Calapan, the capital of Mindoro, in repacking the camp outfit, rations and equipment, and in endeavoring to obtain information regarding Mount Halcon. As we expected, but very little which was definite regarding it could be secured in Calapan. Fortunately, we met an American who had a placer claim on the Binabay River and who had been as far inland as the junction of the Binabay with the Alag. He informed as that a good trail existed from Subaan to the Alag River and although he had no information regarding the country beyond the Alag, he was of the opinion that Halcon could be reached and ascended by this route. Topographically, this seemed to us to be the more direct way, although Lieutenant Jennings had reported his belief that a more feasible route could be found from the south, either by way of the Catuyran River, a tributary of the Baco, from Lake Naujan, or from the west coast. We were already acquainted with Mr. Whitehead's experiences on the Dulangan spur of Halcon and also aware of the fact that Lieutenant Jennings had been unable to reach the highest peak of Halcon by following Whitehead's course, and as a selection of any of the routes suggested by Lieutenant Jennings would have necessitated much more overland travel than by way of the trail leading inland from Subaan to the Alag River, the latter was chosen. Accordingly, two large native boats were secured to take the party and equipment up the coast to Subaan, a small village about 10 miles northwest of Calapan; November 1 was entirely occupied in making this trip, and in securing the native carriers for the journey inland. On the morning of November 2 the party left Subaan for the Binabay River, two scouts remaining behind to guard the food supply and equipment which was not immediately taken forward. As rations for forty days had been brought and as the equipment and supplies for field work were bulky and difficult to transport, it was found quite impossible to secure the necessary carriers to take all at one trip, so that plans were made to establish camps from time to time and have the material brought in by relays. The trail for about 2 miles led through an open, flat, semicultivated region and shortly after leaving the coast we were obliged to ford the Subaan River, a stream of considerable size. At the end of 2 miles the trail left the level land and crossed a broad, interrupted ridge, densely forested with magnificent trees and broken by ravines containing small streams, some tributary to the Subaan River, others to the Binabay. The highest altitude reached on this ridge was about 1,000 feet. We established our first camp where the trail crossed the Binabay River at a distance of about 6 miles from Subaan and at an altitude of 700 feet, making it with some American miners who had located a placer claim in the stream bed as coarse gold to a limited extent is found in the sand.

On November 3 the carriers were sent back to Subaan for more supplies and the other members of the party reconnoitered for trails in the vicinity leading towards Halcon, climbing to the top of the ridge to the southwest to an altitude of 1,200 feet. At the top of this ridge we entered the first Mangyan clearing and here saw the only representatives of these people who were encountered on the entire trip.

Three small houses, each consisting of a platform raised 2 to 3 feet from the ground, with a thin roof of palm leaves, but without walls, were located in this clearing, and later, along the ridge a short distance to the southwest, a larger house was found. All the houses were deserted on our arrival in the clearing, but on the return trip, in the first house we found an old man and his son, who told us that his family had fled at our approach, but that when he saw there were white men in the party he had returned. These people were all small in size, being about 4 feet 10 inches in height, their hair was short and curly.

From the opening which we had reached we secured a magnificent view of Halcon to the south, while the coast region and Calapan were visible to the east. We found two trails leading down to the Alag River, one from the southeast corner of the clearing and the other from the south side. The latter, being more in the direction of Halcon Peak, was selected for our route. On November 5, our carriers having arrived from Subaan the day before, we left the Binabay River and on arrival in the clearing mentioned above again encountered the old Mangyan who said that he was too old to act as our guide, but that he could secure for us one who knew the trails. As a guide familiar with the routes leading to Halcon would have greatly facilitated our work, he was asked to procure one, but after waiting about an hour we decided that he had no intention of returning and so we went on to the Alag River. The trail was well defined, leading down a 30° to 45°, well forested slope. Just before we reached the Alag the path crossed a tributary stream of considerable size which offered no difficulties in fording and as none of our natives had a name for it, we christened it the Egbert River in memory of the late General Harry V. Egbert, United States Army. The distance from the Binabay River to the Alag was about 2 miles. At the point where the trail reached the Alag, the stream was about 100 yards wide, not very deep but quite swift and from the place where we first forded the stream to an altitude of 1,200 feet, where we made our last crossing in the ascent, we found no still water whatever. The American miners living on the Binabay informed us that during the previous ten days there had been comparatively little rain and accordingly we found the Alag fordable. An attempt was made to cross it at the junction of the Egbert River, but it was found to be too swift and deep at that point and we were obliged to proceed up the stream for several hundred yards and then to follow an indirect course along the bars in the more shallow water. It was necessary to ford the stream several times during the day's march in order to avoid abrupt bluffs and cliffs. The Alag, at a distance of about 1 mile above the junction of the Egbert, divides into two nearly equal branches; one, flowing from the direction of the Halcon Range was considered to represent the main stream and the other, being unknown to any of our party, was named Whitehead River in honor of the late John Whitehead, an English naturalist who made the first serious attempt to ascend Halcon.

From the entrance of the Egbert River to that of the Whitehead, the Alag flows through a rather wide valley lying between two low, densely forested ridges, the river in this interval being from 50 to 100 yards wide. Our trail followed the margin of the stream, sometimes on one side, sometimes on the other. However, after passing the entrance of the Whitehead River the banks of the stream became very irregular, its bed being much narrower, so that because of the corresponding increasing difficulties in fording it was found advantageous to travel through the underbrush along a bench about 25 feet above the level of the stream. This necessitated slow progress as we were obliged to cut a trail through the dense vegetation. Continuing on up the Alag for a short distance above the junction of the Whitehead River, Camp Number Two was established late in the afternoon. On November 6 and 7 the carriers were sent back to Subaan for further supplies and the remainder of the party reconnoitered up the Alag. The river cañon was found to be very narrow, with perpendicular cliffs sometimes several hundred feet in height and covered with dense vegetation, which often rose abruptly from the bed of the stream. In searching for the most feasible route for our carriers the banks were climbed at intervals, but in no case could a view be secured because of the dense thickets. It was decided that the only practicable course, for the present at least, was along the bed of the stream. The advance was rendered very difficult because of the narrowness of the cañon and the swiftness of the water which made fording impossible in most places; moreover, we were aware of the fact that the river was subject to sudden and enormous floods and that in case of heavy rains we were almost certain to be cut off from our base of supplies. The tremendous force of the water in times of floods was much in evidence as we traveled upstream; great water-worn bowlders, 6 to 15 feet in diameter, were everywhere encountered and in places large caverns had been cut in the solid cliffs by the action of the water. At a distance of about a mile above Camp Number Two and at an altitude of 900 feet, another smaller river joins the Alag from the east, this we named the Bolton, in memory of the late Lieut. Edward C. Bolton, former Governor of the District of Davao, Mindanao. This was undoubtedly the stream which Lieutenant Lee's party followed in crossing the divide between the Alag and Bagbaujan Rivers in April, 1904. A beautiful cascade about 15 feet in height exists just below the junction of this with the Alag, here the whole volume of the river is forced through a narrow passage between two large bowlders, falling into a pool surrounded by high cliffs.

On November 8, with twenty loaded carriers, we broke camp and proceeded up the stream to the junction of the Bolton River. Here, finding it no longer possible to follow the Alag, it was decided to take the ridge between it and the Bolton which, however, was exceedingly steep and covered with dense forests. No trail was to be found and accordingly one had to be cleared as we advanced. Ascending to an altitude or 2,250 feet, we came into a deserted Mangyan clearing and before us, across the valley of the Alag, was a magnificent panorama of the entire Halcon Range. Progress during this day had been exceedingly slow because of the difficulties encountered in proceeding along the Alag and in ascending the ridge, it being necessary to limit our speed to that of our loaded carriers. Late in the afternoon it was found that we had convered a distance of but approximately 1½ miles. It was then decided to establish Camp Number Three in the Mangyan clearing, with a subsidiary base camp at the junction of the Alag and Bolton Rivers and consequently natives were sent out to locate water and a messenger was despatched on the trail to instruct our scouts to establish a base camp at the place indicated and to build grass houses of sufficient size to accommodate all of our carriers who were to be traveling back and forth bringing supplies. Just before dark our natives reported "no water" and we prepared for a dry camp, when a brisk shower came on which enabled us to catch enough water for our immediate needs on the tent fly and ponchos. Early on the following morning our natives located a small stream tributary to the Bolton River at several hundred feet below our camp.

As many essential supplies remained at Subaan and at various points along the trail, most of the carriers were sent back to the coast, and from November 9 to 11 the country was explored for trails or for a feasible route to the main range of Halcon. At first it was thought that the best one would be by way of the ridge which we were then on, and that by following this we could avoid descending into the cañon of the Alag. Two of the party followed the ridge to the southwest of our camp for some distance, attaining an altitude of 3,500 feet. Although they found that it might be possible to gain the main range by this route, such a course would necessitate a long detour in order to pass the Alag and practically every foot of the distance would be gained only by trail cutting of the most difficult kind through the dense ridge thickets. In the meantime others of the party reconnoitered in the direction of Halcon peak, finding a well-defined Mangyan trail leading to the Alag at some distance from our camp. On November 12, some of our carriers having returned the night before, we left the camp in charge of two natives and proceeded with thirteen loaded carriers along the Mangyan trail to the Alag. The slope was very steep, being 60° to 70°, and after descending about 1,000 feet we reached the bottom of the cañon at a point where two streams of equal magnitude joined. Here we found that the Mangyans, in order to be independent of the river in times of flood, had constructed a suspension bridge across the cañon. This was about 75 feet long, made of seven rattan stems so arranged that the lower three strands formed a foot bridge, the upper two serving as hand rails. On both sides of the cañon these rattans were firmly attached to large trees and on the west bank they passed over a huge bowlder in order to give the span sufficient altitude above the water in times of flood.

The west branch was considered to represent the main stream, and the fork flowing from the direction of Halcon Peak was named the Halcon River. The party crossed the Alag, some by means of the suspension bridge, others by fording; the trail was found to continue on up the opposite bank, undoubtedly leading to a recent clearing of considerable magnitude which was plainly to be seen from our Camp Number Three and from which it did not appear feasible to ascend Halcon. Accordingly, we crossed the Halcon River, taking the ridge between it and the Alag, continuing until we reached an altitude of about 3,200 feet, under the impression that we were on the ridge leading to the main range. Late in the afternoon it was discovered that we had still another cañon to cross, and as our carriers were exhausted, we established Camp Number Four in the forest, without water other than the small supply which we had in our canteens and such meager amounts as could be secured from freshly cut rattan stems.

Striking camp at daybreak on the 13th, we proceeded along the ridge for a short distance when we reached a deserted clearing; passing through this we entered a more recent and occupied one which was several hundred acres in area, where one or two deserted houses were found. About one and one-half hours after this we reached the cañon between us and the main ridge, crossing it near its head. The stream in this cañon was called the Cuming River in honor of Hugh Cuming, an Englishman who made extensive collections of plants and animals in the Philippines between the years 1836 and 1840. Breakfast was prepared at this point and at about 10 o'clock we were again on the march, proceeding up the steep eastern bank of the Cuming River, following a rather indistinct Mangyan trail. Near the top of the ridge we entered a deserted clearing containing the ruins of an old house, where the trail seemed to end. From this point a course was taken up the crest of the ridge, which here was rather broad, although it gradually narrowed as we ascended and we soon found ourselves forced to cut our way through exceedingly dense thickets up an 80° slope. After much difficulty we attained the summit of a small spur covered with dense, characteristic, mossy forest. As it was late in the afternoon when the crest line was reached, Camp Number Five was established on the narrow bench in the dense forest, just below the top of the ridge, a small stream being located about one-fourth of a mile distant and 300 feet below. The distance covered in this day was only about one and one-half miles. On November 14 the carriers were sent back to the base camp on the Alag River for further supplies and on this and the following day trails were opened up on the ridge to an altitude of 7,000 feet, and a point at an altitude of 6,300 feet was selected for Camp Number Six.

Trail cutting became progressively more laborious as we advanced, because of the increasingly stunted character of the vegetation. No particular difficulties were encountered in the first mile, the trail being opened just below the crest of the ridge, but beyond this point further progress was found to be impossible because of a perpendicular landslide which was in our path, making it necessary for us to force our way through the exceedingly dense thickets up a very steep slope to the top of the ridge, the summit of which was attained at an altitude of about 6,650 feet. This ridge was found to slope gradually upward and it varied from 5 to 30 feet in width, in most parts breaking abruptly on both sides in nearly perpendicular slopes. The crest line forest was composed of stunted trees with short, stout trunks and stiff branches, often semiprostrate, and with large spreading roots raised more or less above the ground. Intermixed with the trees was a heavy stand of shrubs and bushes, while an abundance of the very spiny rattans, and nearly as spiny smilax, clambering everywhere through the thickets, rendering trail cutting always a difficult operation and frequently a painful one as well. Everywhere the ground and the trunks and branches of the trees were covered with thick masses of yellow and green moss, filmy ferns, numerous orchids and other epiphytic plants, the ground mat often being one foot or more in thickness, composed of mosses, lichens, ferns and herbaceous plants. A trail was cleared along this ridge to the foot of the sharp slope at an altitude of about 7,000 feet.

We had been favored with exceptionally good weather up to this time, only an occasional shower interfering with our progress, causing no greater inconvenience than a more or less thorough wetting of our persons, which was of minor importance as we were wet nearly every day in fording streams. However, on reaching an altitude of 4,500 feet we entered the region of practically constant fogs and rains which made traveling exceedingly unpleasant because of the wet thickets and heavy drip from the leaves even when it was not raining, as well as because of the reduced temperature, the thermometer rarely registering above 60° F.

We established Camp Number Six on November 17 at an altitude of 6,300 feet at a point previously selected and at a short distance below where our trail ascended to the crest of the ridge. No running water was to be found within a half mile of the camp, but the practically constant rain which prevailed for the thirteen succeeding days rendered the distance from running water of secondary importance. The slopes on the north were very precipitous and in many places entirely denuded of soil and vegetation, where extensive portions of the main ridge had slid into the valley. The land slides, some of them of recent origin, present a bare, rocky face, covered only in places with a scant growth of grass, herbaceous plants and small bushes. We secured a magnificent, view of Halcon, which was 1½ miles distant across a deep valley, by cutting out a few trees on the steep slopes below our camp, but the peak was very rarely visible because of the prevailing fog and rain. Occasionally at intervals of cessation in the severe storm which now came on, the wind would drive the fog away. Judging from these glimpses it became very evident to us that from our present position the only route leading to the latter was by way of the ridge on which we were. On November 18 our carriers came in from Subaan, having made the trip from the coast in three and one-half days. Some were retained for work about the camp, some were sent back to the base camp at the junction of the Baco and Alag Rivers to remain there until further orders, while others were returned to Subaan to bring in food to supply the party on the trip back to the coast. The ones whom we retained at Camp Number Six suffered much from the cold and dampness, as also did the Americans in the party.

Realizing that our food supply was limited and that, because of the present storm, the Alag would be unfordable and accordingly no further supplies could be brought in, it was deemed unwise to remain in camp hoping for a change in weather, hence, on the morning of November 19, Mr. Hutchinson and I proceeded by way of the ridge to an altitude of 7,000 feet where previously we had cleared a trail. We continued it up the steep slope, attaining the main ridge at an altitude of 7,800 feet; the one leading to Halcon Peak running from the east to the west at about right angles to our ridge trail. The montane brush of the upper ridges became reduced to an open heath commencing at the crest line and extending for some distance down the southern slope, the ground cover consisting of tufted grasses, with only occasionally scattered stunted bushes and shrubs, a most grateful change from the dense, mossy ridge thickets through which previously we had been obliged to cut trails. However, these heath lands were limited in extent and so we passed rapidly through them and found the succeeding ridge thickets to be very much more dense than those farther down. Progress through them was literally foot by foot and then only by constant use of bolo. The heavy rain which had set in a few days before, still continued without cessation, adding to our discomfort, the temperature being constantly below 15° C. Owing to the low temperature, the high wind and the continual rain, our position was exceedingly uncomfortable and at times of especially heavy downpours the warmth of our bodies did not suffice to keep the temperature of our wet clothes up to a degree of comfort, the occassional, heavy bursts of cold rain cooling the body to such an extent that, even with the very active and arduous work of trail clearing in the dense thickets, our sufferings from cold were greatly accentuated. At times, as we came to the crest line, the cold wind would add to our discomfort, although much of the time we were fortunately sheltered from it by the dense thickets. Pitcher plants (*Nepenthes*) became very abundant, clambering everywhere in the thickets, so that in cutting our way through the underbrush, at frequent intervals our bolo slashes would upset the equilibrium of from one to a half dozen pitchers, each holding one-half quart or more of water, which would be precipitated upon us. These irregular douches were far more disagreeable than the constant shower bath from the falling rain.

The heath lands on the upper ridges were interrupted by deep ravines, filled with very dense vegetation through which progress was exceedingly slow. Unfortunately for us, these heath lands were very limited in area and we soon came to a dense ridge thicket which we afterwards learned continued uninterruptedly to the summit of the highest peak. Along this ridge we cleared a narrow trail to an altitude of about 8,300 feet. As it was then late in the afternoon and with the heavy rain still continuing, we returned to camp, arriving just after dark. On November 20 the storm was much more severe than it had been on the preceding days and we were obliged to remain in camp, having little to do other than to listen to the constant drip of the rain and the roar of the streams in the valley below and wondering about the state of the Alag and the safety of our base camp. On the following day the heavy rain continued through the morning, but it slackened at midday, so that we left Camp Number Six at noon and proceeded up to the main ridge, making Camp Number Seven on the open heath at an altitude of 7,900 feet, carrying with us a tent fly and blankets, as well as food for three days. The carriers employed in transporting the material to the high ridge were immediately sent back to Camp Number Six. Light rains continued during the afternoon's march, but toward evening the clouds lifted somewhat, giving us an indistinct view to the south and west. The country south was much more open than that to the north, many of the slopes being grass covered instead of forested, and a number of Mangyan houses were to be seen below 4,000 feet. The entire country toward the south, so far as could be seen, was very rough and mountainous, but the ocean was visible to the southwest; no view to the east and north could be obtained owing to the fogs and clouds. At the point where we pitched our tent a well-defined Mangyan trail crossed the main ridge from north to south, apparently leading up by way of the cañon of the Halcon River or by one of its tributaries, or from one of the Mangyan clearings which we did not visit. As the trail was a much traveled one it seems probable that there is considerable communication between the people living to the north and to the south of Halcon. Evidently, these

Mangyans do not possess the usual superstitions regarding mountains which are found among most natives of the Philippines, or at least not to such a degree as to prevent them from ascending the high ridges. Just before dark the heavy storm set in again, continuing all night and throughout the following day. In spite of it, we left camp on the morning of November 22 with the object of reaching the highest point on Halcon. In passing from the point where we stopped trail cutting a few days before, to the summit of the mountain, we encountered the densest thickets seen on the entire trip, and immediately below the peak it took two men three and one-half hours of constant and heavy work with bolos to open a very narrow trail, for a distance of less than one-half a mile. At 1 o'clock in the afternoon of November 22, twenty-one days from the coast, the party reached the highest point on Halcon. The summit being shrouded in clouds, no view was obtained and as all the members of the party where suffering severely from the cold and rain, we stopped only long enough to take aneroid readings and to deposit a record of the trip, which was placed in a sealed bottle and secured to the largest tree on the summit, there being no bowlders available of which to build a cairn. The top of Halcon is a somewhat flattened ridge about one-eighth of a mile long, sloping gradually to the southeast; the peak is covered with a dense growth of stunted trees, none of them more than 10 feet in height, the ground and the trunks, branches and even smaller branchlets of the trees being thinkly covered with from 5 to 15 inches of moss.

No marks of a trail were observed and no signs were seen anywhere in the vicinity of the peak which would indicate that the summit had ever been visited by human beings, and it would be physically impossible for any person to reach it through the dense forest growth without leaving signs of trail cutting. Late in the afternoon the party arrived at Camp Number Seven and spent a most disagreeable night in wet clothes and blankets, as it was impossible to start a fire because of the continuous wind and rain and consequently no warm food could be prepared. On the morning of November 23 we returned to Camp Number Six and during the two following days we were obliged to remain there because of the storm. On the morning of November 26, our carriers who had remained at the base camp at the junction of the Alag and Bolton Rivers, came back reporting the Alag River very high and unfordable, and for that reason the carriers who had been sent to Subaan had been unable to return; moreover, the food supply at the base camp was very low. As we had no further object in remaining at the higher altitudes we broke Camp Number Six on the morning of November 26 with the intention of sleeping that night at the large Mangyan house described on page 182. As we had but few carriers, every member of the party was obliged to pack a heavy load. The topographer and hospital corps man left Camp Number Six about half an hour before the remainder of the party, but on our arrival at the Mangyan house they were not to be found, having apparently lost the trail, nor did they appear that night.

On the following day, with the Mangyan house as headquarters, search was made on the back trail for the missing men and messengers were sent down to the Alag River to see if they had arrived at the base camp. No trace of them was found on this day and on the 28th the search was continued. In the morning word was received that they had not appeared at the base camp and accordingly a party was detailed to make a more thorough search on the back trail. However, in the afternoon the lost men appeared in the Mangyan clearing. It seems that on coming down the ridge from Camp Number Six they had missed the trail crossing the headwaters of the Cuming River, and had proceeded for some distance down the main ridge leading toward the Halcon before discovering their mistake. Thinking it possible that they could easily reach the Alag at the point where the suspension bridge crossed the cañon, they continued on down the ridge, but where unable to reach the stream because of the steep cliffs. Accordingly, they retraced their steps for some distance and found an old Mangyan trail which they followed for some time, crossing the Halcon by a second suspension bridge and again attempting to reach the Alag and follow it to the junction of the Bolton River, but once more, because of the dense thickets and high cliffs, they were obliged to give up the attempt. Finally, they retraced their steps by the main ridge, located the trail crossing the headwaters of the Cuming River, and arrived at the Mangyan house after having been out nearly three days without other food than a few acorns which they found in the forest. While we were searching for this party on the ridges, they were in the cañons attempting to reach the streams and accordingly did not hear our shouts or shots.

Because of the weak condition of the men who had been lost, no further progress was made until December 1, except to concentrate our supplies and equipment at Camp Number Nine, at the point where the Bolton River joints the Alag. The Alag was still high and unfordable, although the water was about six feet below the point at which it had been a few days before. All members of the party had been on short rations for several days and there seemed to be no immediate prospect of further supplies reaching us from the coast. On the afternoon of November 30 a rude bridge was built across the Alag at Camp Number Nine by felling trees and floating the trunks down stream so that they lodged against bowlders in the bed of the river, the ends of the trunks being lashed in place with rattan and a hand-rail was added. A brisk rain in the night caused the river to rise considerably and one-half of the bridge was carried away, so that we had to replace it on the following morning. On December 1, the first clear day after thirteen days and nights of nearly constant rain, we broke Camp Number Nine and moved all the material across the river, but as we had with us only seven carriers, a temporary camp was established on the opposite bank and the two American soldiers, who were still in a weak condition, were left in charge.

At noon, the remaining members of the party, all heavily loaded, proceeded down the east bank of the Alag. Many difficulties were encountered during the afternoon. In a number of places where bluffs arose abruptly from the stream and which on the up trip we had been able to avoid by fording the river, we were now obliged to climb, fording being entirely out of the question. These frequent detours entailed extensive trail cutting which, with a 50-pound pack, soon became a decidedly painful operation, especially as in order to find a feasible route we had frequently to climb the steep banks or to follow the nearly as steep ravines to a height of two or three hundred feet or more. Camp was made just after dark at the foot of a bluff on the edge of the river. A daybreak on December 2 we proceeded down the stream to a point opposite the entrance of the Egbert River, where Camp Number Ten was established.

All the carriers were immediately sent up the river to bring down more supplies, a scout, who succeeded in crossing the Alag with some difficulty, went into Subaan for additional ones, and one man was sent to the Binabay River for food. Fortunately for us the weather still continued clear and the Alag fell rapidly. On December 3 the carriers were again dispatched up the Alag to bring down the remaining equipment, returning to camp late in the afternoon, the two soldiers accompanying them and at the same time the bearers from Subaan arrived, reporting that they had encountered serious difficulties in crossing the Alag on the trip back to the coast, but that they had finally reached their destination and started back with supplies. On their return, finding that the river was high and that it was impossible to cross, they remained on the north bank of the stream for three days waiting for the waters to subside, and then returned to Subaan. As the carriers came in late in the afternoon it was impossible for us to move camp across the river on that day. A heavy rain came on in the night which caused us considerable anxiety for the reason that if it continued for any length of time, we should be unable to cross the river on the following day and would be obliged to follow the stream down to tide-water along the south bank.

The rain continued throughout the night and at daybreak we found that the water had risen about six inches, so that the stream was still fordable, although with great difficulty and considerable danger. Heavily loaded carriers with the assistance of one or two men without loads could usually keep their footing, but some of them were carried downstream by the current, wetting some of our equipment. The Americans in the party who attempted to cross without loads, depending entirely on heavy poles for assistance, were invariably carried down by the current and were obliged to swim the last few yards in the very swift water. After many delays and heavy work all the equipment was taken across the river and transported to the top of the ridge between the Alag and Binabay Rivers, where Camp Number Eleven was established. The party made an early start on the morning of December 5 and proceeded by way of the Binabay to Subaan, arriving there about 2 o'clock in the afternoon. We were obliged to remain in Subaan throughout the following day and 4 o'clock on the morning of December 7 embarked for Calapan on a large sailing banca, arriving at noon. On the night of December 9, after forty days, the party returned to Manila, having accomplished the objects of the trip.

GENERAL OBSERVATIONS.

No data are available regarding the rainfall in Mindoro but judging solely from the vegetation in the southern part of the Island, the rainfall there is much less and the dry season much more prolonged than it is in the North, in the vicinity of Halcon. The presence of this high mountain and its subsidiary ranges causes an enormous precipitation, extending continuously over nine months of the year, from May to January, while the so-called dry months, February, March and April, are not always completely so, as is to be seen from the heavy rain encountered by Lieutenant Lee in April, 1904. During most of the year the mountain is shrouded in fogs and is very rarely entirely free from clouds for any extended period. The fact that the rivers flowing from the Halcon Range, although comparatively short, carry an enormous body of water and that they are subject to great and frequent floods, as both our party and Whitehead learned from experience, would indicate an abnormally heavy rainfall. The vegetation of Halcon, not only that of the higher altitudes, but of the lowlands surrounding the mountain and extending even to the coast at Baco, demonstrates a high and practically uninterrupted humidity throughout the year. Abundant epiphytes, ferns, orchids and other plants and especially the filmy ferms, which are dependent upon a high and constant humidity for their existence and are identical with, or similar to the species on other mountains in the Philippines at altitudes above 3,000 feet, are found in the vicinity of Halcon, sometimes at sea level. In the forests along the rivers at as low an elevation as 250 feet such plants are abundant and many species are represented.

Halcon is covered with and surrounded by the most dense forests excepting where the vegetation has been destroyed by the Mangyans. From the limits of cultivated land along the coast, extending inward and up to an altitude of 3,000 feet, the trees are of large size and would prove to be of considerable commercial value for timber if the question of transportation were a more simple one. Beginning at an altitude of about

1,200 feet on the ridge between the Alag and Binabay and at about 5 or 6 miles from the nearest Tagalog settlements, one finds traces of the Mangyans in clearings, occupied or deserted. It is the custom of these people to clear a given area by chopping down the trees and brush and after burning it over they plant upland rice, corn, and other crops. Such clearings will be occupied for one or more years until the soil shows signs of exhaustion, until the slopes are denuded by erosion or until the exuberent tropical vegetation becomes too great an obstacle to the primitive agriculturist. He then clears another piece of ground and the deserted one soon reverts to its former forested condition. After a term of years the same land may be cleared again by the same methods. Everywhere on the more gentle slopes from the Binabay River to an altitude of 3,500 feet on Halcon, we observed clearings in all stages, from those freshly cut and not yet burned to those in cultivation, and from those recently deserted to clearings in all stages of reversion to forest. Some of these were very extensive and must have entailed a great amount of labor, for many of the trees felled were 3 feet in diameter, and the only tools possessed by the Mangyans are working bolos and very small, narrow axes.

From a forestry standpoint, practically all the forests in the immediate vicinity of Halcon have been ruined by the above methods of clearing, for it seems evident that the Mangyan selects virgin woods for his work of destruction, doubtless because he has found from experience that the soil is better than in those localities where he has previously cleared and which have reverted.

The floristic conditions [10] of the lower forests indicate high and continuous humidity, shown by the numerous ferns, mosses and epiphytes. As higher altitudes are reached these epiphytes become progressively more abundant, until on the exposed crest-line ridges, beginning at 4,000 feet, the trees are found to be completely covered with a dense mass of mosses and epiphytes, so thick and close that frequently the bark of the tree is not visible. The character of the vegetation entirely changes, the constituent species of the lower forests disappear and others totally different in aspect take their place. Various species of oak and one species of maple are abundant at intermediate altitudes, but on the ridges the vegetation is largely characterized by certain species found in such habitats throughout Malaya. Epiphytic ferns and orchids and other plants become more plentiful and there is a greater diversity in species; mosses are much thicker and more luxuriant, enwrapping even the branches and branchlets of the trees and forming a deep, soft, soil cover, frequently a foot in thickness. Epiphytic shrubs and vines are abundant and give an added character to the vegetation; rhododendrons, huckleberries, raspberries and other plants characteristic of the more temperate regions made their appearance, and the pitcher plant (*Nephenthes*), becomes common, climbing through the thickets. The vegetation again gradually changes above 4,000 feet, the trees and shrubs become more stunted and dwarfed, epiphytes increase in abundance, peat moss appears in the ground cover and many of the constituent species of trees, shrubs, herbaceous plants, epiphytes, etc., are again quite different from the ones at 4,000 feet. On gaining the high, main ridge, at 7,800 feet, there is a most radical change; the montane brush has become reduced to a mere heath over considerable areas, the ground having a thin cover of grasses with scattered, stunted bushes and shrubs, a curious mixture of north-temperate and Australian types. These heath lands disappear along the ridge towards the high peak and the montane brush is again in evidence, but more stunted and much more dense than on the lower ridges; epiphytic orchids and ferns become reduced to few species and there is a corresponding increase in the abundance and density of the mosses and lichens which everywhere cover the ground and trunks of the brush. Small branches, even no larger than the finger, appear to be 6 inches or more in thickness owing to their dense covering of yellow and green moss. These upper thickets represent the densest vegetation I have ever observed in the Philippines. It was almost impossible to penetrate it even with a liberal use of the bolo.

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[10] For an account of the Flora of Mount Halcon see Merrill, *this Journal C. Botany* (1907), 2, 251.

CONCLUSION.

The origin of most of the mountains in the Philippines is due to volcanic activity, but Halcon is radically distinct from the others in structure. It is a mass of granite, white quartz, schist and marble. Iron pyrites was observed in some localities, while gold in small amounts is found in the sands of the streams flowing from it. Slate was observed by Mr. McCaskey a short distance north of the main range. In general structure, so far as can be determined from descriptions to be obtained, Halcon seems geologically to be the same as Mount Kinabalu, British North Borneo, the highest peak in the Malayan region.

Halcon Range is a fold, the main ridge running in a generally east and west direction, irregular in profile, but continuous for a long distance at high altitudes. So far as could be determined, three great ridges radiate from the main range, one to the west, one to the south and one to the east, while to the north especially, the slopes are very precipitous and show several subsidiary spurs.

Mindoro itself is anomalous in some respects as compared with other islands of the Philippine group, but later when more definite knowledge is secured regarding it and its neighbors, it may be shown that it is really the oldest part of the Archipelago proper. The one large mammal found in the Philippines, *Bubalus mindorensis,* said to be most closely related to a Celebes form, is confined to the Island of Mindoro; certain genera of lowland plants, such as *Antiaris, Chrysophyllum, Ochthocharis,* etc., characteristic of the Malayan region in the west and south, are known in the Philippines only from Mindoro, while the plants from the higher altitudes on Halcon show remarkable affinities with those known from Mount Kinabalu, North Borneo, in many cases they are of specific identity and encountered only in the two localities. At the same time there is a remarkable number of Australian types present in the Halcon flora. From the geological, botanical and zoölogical evidence at hand, indications are found which would seem to point to an early land connection between Mindoro and some great mass to the west and south, but at the same time there is shown a prolonged separation and apparently a greater age than has been discovered in any other part of the Philippines proper. It is probable that Mindoro, in the various disturbances which have from time to time submerged portions of the Archipelago, has constantly remained above the sea.

Extensive collections of natural history specimens were made on the trip, but most of the material was collected and prepared under the most adverse conditions. A series of papers based on this matter, which will add much to our knowledge of the fauna and flora of the Philippines is planned.

A feasible route to the mountain was discovered and mapped, and it was proved that Halcon could be ascended even at the most unfavorable season of the year. The course of the Alag River was in part determined and charted, this large stream not being shown at all on many maps of the Philippines. Several of its tributaries were located and named.

To anyone contemplating a like trip on Halcon the following recommendations will prove to be of some value, and will apply as well to many other mountains in the Philippines. Brown soap should be issued regularly to the native carriers to be used as a leech repellent. This is smeared on the bare legs once or several times a day if necessary, for the loss of blood from the attacks of leeches is always considerable, and serious complications which might cripple a party in regard to transportation might arise from a resulting infection, for on Halcon the only feasible method of transportation is by carriers. All members of the party wearing shoes should be equipped with woolen puttees instead of leather or canvas leggings, as the former are proof against the attacks of leeches, while the two latter give no protection whatever. Eyeholes on shoes should be smeared with soap each day. Quinine should be issued regularly to the members of the party to guard against outbreaks of malaria. All supplies needed on the entire trip should be carried, as no food can be secured in the interior of Mindoro, at least on the north of the Halcon Range, except a few very poor *camotes,* and some small game such as birds, rats and monkeys, the latter two generally not being considered acceptable food. If one is not limited as to time, doubtless the best carriers for such a trip as we took would be the Mangyans, but they can be approached only with difficulty and because of their superstitions can not be relied upon to stay with a party. As carriers are very difficult to secure in Mindoro and do not prove satisfactory even when they are found, they should be secured at some point in Luzon and landed with the party making the ascent. Camp outfit and equipment should be made as light as possible and food should be confined to essentials. All food supplies and equipment should be wrapped in waterproof packages; the packs should be adapted to carriers and should not exceed 40 or 50 pounds in weight for the ordinary carrier.

The proper time for ascending Halcon, judging from our imperfect knowledge of the rainfall in the vicinity of the mountain, is in the months of February, March, April, and May, but these months are by no means dry, as is shown by Lieutenant Lee's experience north of Halcon in April. During the remaining months of the year heavy rains prevail, and anyone penetrating beyond the Alag River on our route would do so at the constant risk of being cut off from his base of supplies, as in reality happened to our party. To be cut off for any extended period in the interior of Mindoro would be in most cases a very serious complication and every precaution should be taken to avoid it.

My acknowledgment and thanks are due to Major J. K. Thompson, United States Army, for the accompanying map and for the copies of Lieutenant Lee's report; and to Major George P. Ahern, Director of Forestry of the Philippine Islands, for copies of Lieutenant Jenning's and Foresters Merritt's and Hutchinson's reports.

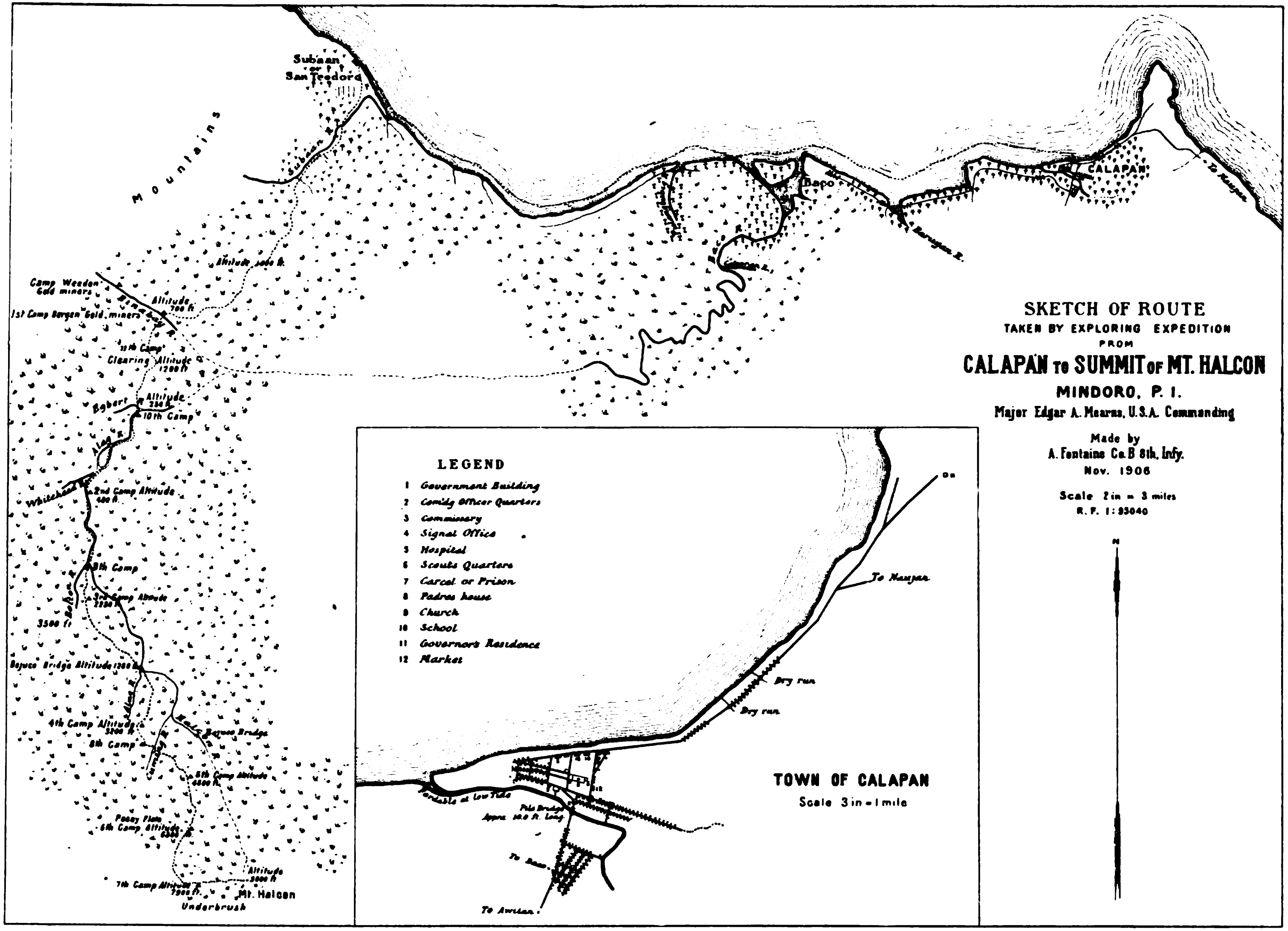
SKETCH OF ROUTE
TAKEN BY EXPLORING EXPEDITION
FROM
CALAPAN TO SUMMIT OF MT. HALCON
MINDORO, P. I.
Major Edgar A. Mearns, U.S.A. Commanding
Made by
A. Fontaine Co. B 8th. Infy.
Nov. 1906
Scale 2 in = 3 miles
R. F. 1: 95040
N
CALAPAN
To Naujan
Baco
Baruyan R.
Subaan or San Teodoro
Subaan R.
Mountains
Altitude 1000 ft.
Camp Weeden Gold miners
Altitude 700 ft
1st Camp Bergen Gold. miners
11th Camp
Clearing Altitude 1200 ft
Egbert R.
Altitude 2340 ft
10th Camp
Alag R.
Whitehead R.
2nd Camp Altitude 400 ft.
9th Camp
Bohon R.
3rd Camp Altitude 2230 ft
3500 ft
Bejuco Bridge Altitude 1280 ft
4th Camp Altitude 3200 ft
8th Camp
Bejuco Bridge
5th Camp Altitude 4800 ft.
Peaty Flats
6th Camp Altitude 6300 ft.
Altitude 9000 ft
7th Camp Altitude 7900 ft.
Mt. Halcon
Underbrush
LEGEND
1 Government Building
2 Com'dg Officer Quarters
3 Commissary
4 Signal Office
5 Hospital
6 Scouts Quarters
7 Carcel or Prison
8 Padres house
9 Church
10 School
11 Governors Residence
12 Market
To Naujan
Dry run
Dry run
TOWN OF CALAPAN
Scale 3 in = 1 mile
Fordable at Low Tide
Pole Bridge Appx. 50.0 ft. Long
To Baco
To Awisan

PLATE I.

PREVIOUS PUBLICATIONS OF THE BUREAU OF GOVERNMENT LABORATORIES—Concluded.

(Concluded from second page of cover.)

No. 32, 1905.—Biological Laboratory: I. Intestinal Hæmorrhage as a Fatal Complication in Amœbic Dysentery and Its Association with Liver Abscess. By Richard P. Strong, M. D. II. The Action of Various Chemical Substances upon Cultures of Amœbæ. By J. B. Thomas, M. D., Baguio, Benguet. *Biological and Serum Laboratories:* III. The Pathology of Intestinal Amœbiasis. By Paul G. Woolley, M. D., and W. E. Musgrave, M. D.

No. 33, 1905, Biological Laboratory.—Further Observations on Fibrin Thrombosis in the Glomerular and in Other Renal Vessels in Bubonic Plague. By Maximilian Herzog, M. D.

No. 34, 1905.—I. Birds from Mindoro and Small Adjacent Islands. II. Notes on Three Rare Luzon Birds. By Richard C. McGregor.

No. 35, 1905.—I. New or Noteworthy Philippine Plants, IV. II. Notes on Cuming's Philippine Plants in the Herbarium of the Bureau of Government Laboratories. III. Hackel, "Notes on Philippine Grasses." IV. Ridley, "Scitamineæ Philippinenses." V. Clarke, "Philippine Acanthaceæ." By Elmer D. Merrill, Botanist.

No. 36, 1905.—A Hand-List of the Birds of the Philippine Islands. By Richard C. McGregor and Dean C. Worcester.

The previous publications of the Bureau were given out as bulletins in serial number pertaining to the entire Bureau. These publications, if they are desired, can be obtained by applying to the librarian of the Bureau of Science, Manila, P. I., or to the Director of the Bureau of Science, Manila, P. I. Correspondents will confer a favor by returning to the Bureau any previous publications which they may have in duplicate, as a number of bulletins are now out of print.

LIST OF PREVIOUS PUBLICATIONS OF THE MINING BUREAU (NOW DIVISION OF MINES OF THE BUREAU OF SCIENCE).

1890.—Descripción física, geológica y minera en bosquejo de la Isla de Panay por D. Enrique Abella y Casariego, Inspector General de Minas del Archipiélago.

1890.—Memoria descriptiva de los manantiales minero-medicinales de la Isla de Luzon, estudiados por la comisión compuesta de los Señores D. José Centano, Ingeniero de Minas y Vocal Presidente, D. Anacleto del Rosario y Sales, Vocal Farmacéutico, y D. José de Vera y Gómez, Vocal Médico.

1893.—Estudio Descriptivo de algunas manantiales minerales de Filipinas ejecutado por la comisión formada por D. Enrique Abella y Casariego, Inspector General de Minas, D. José de Vera y Gómez, Médico, y D. Anacleto del Rosario y Sales, Farmacéutico; precidido de un prólogo escrito por el Excmo. Sr. D. Angel de Avilés, Director General de Administración Civil.

1893.—Terremotos experimentados en la Isla de Luzón durante los meses de Marzo y Abril de 1892, especialmente desastrosos en Pangasinán, Unión y Benguet. Estudio ejecutado por D. Enrique Abella y Casariego, Inspector General de Minas del Archipiélago.

1901.—The Coal Measures of the Philippines. Charles H. Burritt.

1902.—Abstract of the Mining Laws (in force in the Philippines, 1902). Charles H. Burritt.

1902, Bulletin No. 1.—Platinum and Associated Rare Metals in Placer Formations. H. D. McCaskey, B. S.

1903.—Report of the Chief of the Mining Bureau of the Philippine Islands. Charles H. Burritt.

1903, Bulletin No. 2.—Complete List of Spanish Mining Claims Recorded in the Mining Bureau. Charles H. Burritt.

1903, Bulletin No. 3.—Report on a Geological Reconnoissance of the Iron Region of Angat, Bulacan. H. D. McCaskey, B. S.

1904.—Fifth Annual Report of the Mining Bureau. H. D. McCaskey.

1905.—Sixth Annual Report of the Chief of the Mining Bureau. H. D. McCaskey.

1905, Bulletin No. 4.—A Preliminary Reconnoissance of the Mancayan-Suyoc Mineral Region, Lepanto, P. I. A. J. Eveland, Geologist.

1905, Bulletin No. 5.—The Coal Deposits of Batan Island. Warren D. Smith, B. S., M. A., Geologist.

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Vol. III.—Relaciones Agustinianas de las razas del Norte de Luzon, by Perez. Not listed by Bureau of Printing.

Vol. IV, Part 1.—Studies in Moro History, Law, and Religion, by Najeeb M. Saleeby. Paper, ₱0.75; half Morocco, ₱3.25.

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[1] The first four bulletins in the ornithological series were published by The Ethnological Survey under the title "Bulletins of the Philippine Museum." The other ornithological publications of the Government appeared as publications of the Bureau of Government Laboratories.

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